
Central Coast Regional Water Quality Control Board

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FROM:

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DATE: April 3, 2018

**SUBJECT: Review Comments and Recommended Conditions of Concurrence,
Proposed Aquifer Exemption Expansion, Sisquoc and Monterey
Formations, Cat Canyon Oil Field, Santa Barbara County**

This memorandum presents the Central Coast Regional Water Quality Control Board (Central Coast Water Board) staff comments and recommendations regarding the aquifer exemption application titled: "Aquifer Exemption, Sisquoc and Monterey Formations, Cat Canyon Oil Field, Santa Barbara County, California" (the application). The application, dated October 2017, was received by Central Coast Water Board staff on January 3, 2018. Central Coast Water Board staff (staff) concur with the proposed aquifer exemption (AE) expansion subject to the comments and conditions described herein.

General Comments

Staff have identified five items related to the AE expansion application that need to be addressed. Item No. 1 describes the uncertainty and required clarification regarding the specific federal justification criteria proposed by the applicant in support of the AE expansion. Item No. 2 describes the need for a qualified agency or individual to provide technical review of and concurrence with information provided within the application in support of the expected future commercial hydrocarbon production justification criteria. These issues must be addressed prior to Water Board staff concurrence with the AE expansion.

Item Nos. 3 through 5 describe data gaps and technical shortcomings of the application associated with documenting compliance with state and federal requirements at the AE level. Given the size and geologic complexity of the proposed AE expansion¹, there is a significant level of uncertainty with respect to the applicant's ability to definitively and uniformly document

¹ The proposed AE footprint covers an area of approximately 45 square miles and includes many geologic complexities including faults, facies changes, pinch outs, etc.

compliance with Title 40 Code of Federal Regulations, Section 146.4 (40 CFR 146.4), and California Public Resources Code, Section 3131 (PRC 3131), for the entire AE expansion based on currently available information. Water Board staff believe these uncertainties can be effectively addressed by conditional approval of the AE expansion requiring the subsequent implementation of specific project-level requirements as part of the review and approval of projects within the proposed AE expansion area.

This application – because of the size and complexity of the proposed AE expansion area - exemplifies the difficulty associated with definitively applying state and federal underground injection control (UIC) program requirements at the AE level and the need to carry these requirements forward via the implementation of project-level conditions and prohibitions as discussed below.

Specific Comments

Item No. 1 – Clarify and Delineate the Proposed Federal Justification(s)

Water Board staff are unable to concur with the proposed AE expansion because the application does not clearly state what federal criteria are being used to justify the expansion. Staff finds that it may be necessary and appropriate to rely on multiple criteria (e.g., 40 CFR 146.4(a), along with both 40 CFR 146.4(b)(1), and 40 CFR 146.4(c)) to justify the proposed AE expansion.² This is because none of the individual criteria listed in 40 CFR 146.4 (b) and (c) appear to apply to the entire proposed AE expansion in both the lateral and vertical sense. Prior to Water Board staff concurrence, the application must clearly state, with supporting technical documentation, which of the specific 40 CFR 146.4 criteria are being used to justify the proposed AE expansion. If multiple criteria are used as suggested above, the application must clearly identify and delineate which of the criteria apply to which portions of the proposed AE expansion, both laterally and vertically.

Item No. 2 – Expectations of Future Hydrocarbon Production

The application appears to justify the proposed AE expansion, based in part, on the portion of 40 CFR 146.4(b)(1) related to the expectation of future commercial hydrocarbon production. However, the application does not identify the qualifications of the individual(s) directly responsible for making such determinations. Water Board staff lack the technical expertise to validate the accuracy of claims made in the application regarding portions of the proposed AE expansion area that are expected to contain commercially producible quantities of hydrocarbons (i.e., areas where there is currently no well data showing the presence of hydrocarbons). Therefore, Water Board staff are deferring to DOGGR or USEPA to evaluate any justification made with respect to this portion of the 40 CFR 146.4(b)(1) criteria. Staff recommend the application be revised to indicate which individual(s) are responsible for the determination of expected future commercial hydrocarbon production, if any, and demonstrate that these individual(s) possess the requisite professional qualifications and experience necessary to make such determinations.

² It is unclear whether USEPA will consider AE proposals that rely on more than one of the justification criteria listed under 40 CFR 146.4 (b) and (c). For its purposes, Water Board staff intend to consider proposals which advance more than one of the Federal justification criteria listed in 40 CFR 146.4 (b) and (c), as long as the portion of the AE, both laterally and vertically, that the each justification applies to is clearly delineated and documented. However, USEPA should be consulted to determine an acceptable methodology regarding the potential use of multiple criteria and what that would entail, versus focusing on just one criterion.

Item No. 3 – Addressing Data Gaps

Due to the absence of wells and associated data within the Sisquoc and Monterey Formations along the northern and eastern margins of the proposed AE expansion area, the application lacks sufficient documentation in support of any 40 CFR 146.4 justification criteria, particularly those dealing with water quality or future water use. Water Board staff finds that it may not be feasible to address this issue as part of the aquifer exemption process without a considerable effort by the applicant to collect additional data and that it could be effectively addressed by the implementation of specific project-level conditions and prohibitions. Consequently, these areas will either need to be removed from the proposed AE expansion or any future projects in these areas will need to be conditioned on the collection of project-specific data documenting compliance with the 40 CFR 146.4 justification criteria.

To ensure adequate protection of groundwater beneficial uses and to facilitate compliance with applicable state and federal UIC requirements, Water Board staff recommend concurrence with the proposed AE expansion be contingent upon a demonstration by the operator for each individual project that the project area meets the 40 CFR 146.4 criteria used to justify the AE expansion. Water Board staff recommend that water disposal projects be prohibited within these areas unless the operator can demonstrate that total dissolved solids (TDS) concentrations of the natural formation water within the proposed injection zone are greater than 3,000 mg/L, or there is documented commercial hydrocarbon production from those portions of the proposed injection zone that will receive injectate.

Item No. 4 - Demonstrating Containment of Injected Fluids

The information provided in the current application does not adequately demonstrate compliance with the fluid containment requirements of PRC 3131(c). While the application includes information indicating that natural physical features (e.g., faults and pinch outs) and operational factors (i.e., inward hydraulic gradients) may provide localized barriers to fluid flow, the evidence presented in support of field-wide fluid containment is not compelling and does not sufficiently demonstrate compliance with PRC 3131(c). The large size and geologic complexity of the proposed AE expansion, along with uncertainty regarding the location, scale, duration, and type of future UIC projects within the AE area, makes it very difficult to assess the likelihood of future fluid containment at the AE application level.

As a result, it is unlikely that the application, even if substantially updated, could adequately demonstrate strict compliance with the containment requirements of PRC 3131(c).

Consequently, demonstrations of compliance with the containment requirements of PRC 3131(c) are more appropriately addressed at a localized, project-level scale via the application of conditional requirements on any subsequent UIC projects within the proposed expansion area. To address this issue, Water Board staff recommend that all new and existing projects within the Cat Canyon Oilfield include, at a minimum, a detailed project-level assessment of the following:

- The expected extent of lateral injection fluid migration over the life of the project,
- Thickness of the upper Sisquoc confining unit throughout the entire project area, and
- Physical and operational barriers to lateral fluid flow beyond the boundaries of the project area.

Furthermore, this information should be submitted as part of UIC project applications in addition to any data or information required by DOGGR.

Item No. 5. Project-Scale Water Well Surveys

The water well survey presented in the application does not adequately describe the extent of the “boots on the ground” well search performed by the applicant, nor does it adequately address the potential installation of new water supply wells within the proposed AE expansion area over time. Given the large size of the proposed AE expansion area, performing a detailed “boots on the ground” well search for the entire proposed AE footprint (plus the one-mile buffer) would be a very time consuming and challenging task. The well survey contained within the application identified a total of 241 current and former water supply wells within the study area.

To ensure continued protection of groundwater beneficial uses, Water Board staff recommend the water well survey presented as part of the AE application be supplemented by more detailed, project-scale water well surveys consisting of a database review and a detailed field search as part of all new project applications and project reviews. The benefits of this requirement are two-fold; first, it allows identification of any new water wells installed since the last well survey, and second, it provides the opportunity for a very focused and detailed field verification search limited to the immediate project area. Given the benefits of such a requirement, as a condition of staff concurrence with the proposed AE expansion, each new project application and project review should include a detailed project-level water supply well search.

In summary, related to Item Nos. 1 and 2 described above, Central Coast Water Board staff determined that the proposed AE expansion application must be revised to clearly identify which federal criteria are relied upon to justify the expansion. Additionally, staff determined that the application must also be revised to include sufficient information to confirm that the evaluations related to expected future commercial hydrocarbon production are made by individual(s) with the appropriate professional qualifications and experience necessary to make such determinations. Lastly, related to Item Nos. 3 through 5, Water Board staff also find that data gaps associated with the size and geologic complexity of the proposed AE expansion make it necessary to condition approval of the AE expansion upon the subsequent implementation of specific project-level requirements as part of the necessary more detailed review and approval of individual projects within the proposed AE expansion area.

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